REMARKS

I. Status of the Claims

Claims 3-5, 7-8, 10-12, 15-17, 19, 20, 22-23, 25, 28-30, 33, 34, and 37-41 are pending in the application. Claims 6, 9, 13, 14, 18, 21, 24, 26, 27, 31, 32, 35, and 36 have been canceled.

II. Rejections Over Prior Art

All of the claims have been rejected over U.S. Patent Application Publication No. 2003/0101902 A1 (hereinafter "Reitnauer"), in view of U.S. Patent No. 6,450,615 B2 (hereinafter "Kojima"), and U.S. Patent No. 5,464,470 (hereinafter "Brachman"), which is the sole grounds of rejection. Applicants respectfully traverse.

III. Arguments

The present invention is directed to an edible ink. The ink contains water-soluble FD&C dye and a fat or wax base. In order to disperse the water soluble dye in the fat or wax base, the dye is dissolved in a fat or wax dispersible carrier for the colorant, such as glycerin and/or propylene glycol. Thus, the technical problem addressed is that the color must be saturated in the fat or wax base to make an effective ink, but there is no solubilization of the water-soluble color in the fat or wax. The least amount of dye used in any of the operative examples of the invention described in Table 2 is about 0.09 percent by weight of the composition, which is also recited in the claims. This requires upwards of 8.52 percent by weight of a propylene glycol carrier, for example, to dissolve the dye and disperse the same in the wax base (see Example 9 of Table 2).

Reitnauer describes a wax-based ink having a colorant, but the colorant

that is used in the examples is Apocarotenal, which is a dispersion in medium chain triglycerides (Reitnauer Example 1, paragraph [0038]). This dispersion in a fat means that the colorant system is soluble or dispersible in the wax base in contrast to the colorant used in the present claims.

Although Reitnauer discloses FD&C dyes (the water soluble dyes that are recited in the present claims), as well as the Apocarotenal dispersion in medium chain trigyclerides used in the examples, and in addition to several lakes, the reference does not disclose how the water-soluble FD&C dye would be dispersed in a wax base. The patent only incidentally mentions glycerin and propylene glycol in a different context, among suitable "oils, flexibilizers and plasticizers" (Reitnauer, paragraph [0031]).

Even if one of ordinary skill in the art selected a water-soluble FD&C dye from the list of colorants in Reitnauer paragraph [0026], that person would not have stumbled upon "a fat or wax dispersible carrier for the colorant in an amount effective to dissolve the colorant," as required by independent Claims 7, 16, 20, and 37-41. In fact, that limitation is a non-obvious departure from the prior art. Specifically, Reitnauer does not disclose that glycerin serves as a carrier for a water-soluble food coloring in a wax base and nothing in Reitnauer teaches the use of glycerin or propylene glycol to solubilize a water-soluble dye and disperse it in a wax base.

The Examiner alleges that small amounts of glycerin (if used in Reitnauer in combination with a water-soluble dye) would dissolve sufficient colorant to make an ink according to the invention. Specifically, the Examiner alleges: "that although glycerin and propylene glycol are used in minor amount [in Reitnauer] that it is still enough to dissolve the water soluble dye present in Reitnauer, as shown by Brachman

wherein a solvent is present in an amount of 0.5 to 3 weight percent to dissolve a water soluble dye that is present in the amount of 0.1 to 5 weight percent that is used in a wax-based composition." (Office Action, page 4, "Response to Arguments"). Although not explicitly stated, this is an inherency argument, that glycerin might be present in a composition according to Reitnauer, and if present, there would be sufficient glycerin and/ or propylene glycol to disperse a water-soluble dye in a wax to make an ink.

As set forth in the Declaration of Arun Shastry submitted herewith, and shown by experiment, it is not the case that glycerin added to a fat or wax base will dissolve a water soluble FD&C dye that is independently added to the base or disperse the dye through the fat or wax base. It is necessary to utilize a carrier for the dye to disperse it in the base. Moreover, Brachman does not teach a dye and carrier system that is dispersible in a wax base to form an ink that could be used in high resolution ink jet printing. Brachman does not disclose that small amounts of glycerin would solubilize an FD&C dye. To the contrary, Brachman teaches a "first marking composition" which may contain colorant in a preferred amount of about 0.1 wt % to about 1 wt % (col. 5, line 50), and a preferred solvent system which is a combination of water and glycerin or povidone, present in an amount of 0.5 to 3 percent by weight (column 6, lines 19-27). Brachman does not teach (1) an amount of glycerin and/or propylene glycol present in the composition sufficient to solubilize a given amount of water-soluble dye (because the solvent also contains water); and (2) sufficient glycerin and/or propylene glycol to disperse the water-soluble dye in an ink.

In fact, the examples in Brachman use glycerin as the sole solvent in only four cases, and in those cases the dye is alcohol soluble (see Table 1). Thus Brachman

does not teach a fat or wax dispersible carrier which completely solubilizes a water-soluble dye.

Thus, the addition of the Brachman reference fails to make obvious the use of a fat or wax dispersible carrier which solubilizes a water-soluble dye, and the rejection should be withdrawn.

Applicants have addressed Kojima in previous responses on the merits. This reference merely teaches properties of hot melt inks, including a viscosity in the range of 8-15 cP, a surface tension in a range of 10 and 70 dynes/cm, and apparently in some cases, an image resolution achieved of 300 dpi.[1] Kojima does not teach that printing can be performed on an edible substrate, such as a sugar shell confectionery, or that edible inks can be formulated to meet the requirements of the disclosed printhead. In particular, Kojima does not disclose compatibility of an edible fat or wax based ink for a wax polished sugar shell surface, characterized by a contact angle, for example. Most importantly, Kojima does not teach one of ordinary skill in the art, starting with the composition of Reitnauer, developed with a specific set of properties for a specific kind of print head, how the composition could be modified to change its properties so that it would be suitable for an entirely different print head. Neither reference provides the motivation to make the asserted combination, adapting edible inks as purportedly disclosed in Reitnauer for use with the printing apparatus of Kojima. The disclosure of the properties of an ink suitable for one type of printer is insufficient to render obvious a specific composition.

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[1] Note that Reitnauer's examples teach an ink viscosity of 22.4 at 135° C (See Examples 3 and 4, paragraph [0044]). Thus Reitnauer is both outside the claimed range, and incompatible with Kojima.

CONCLUSION

Applicants respectfully submit that the independent claims are allowable over the prior art of record for the reasons stated above. Each of the remaining claims, not specifically discussed above, including the dependent claims, incorporates one or more of the limitations discussed above, and should be found allowable over the art of record, for at least the reasons discussed above. Careful reconsideration of each claim, including each dependent claim, is respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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